

- (c) at the decoder decrypting the transmission word; and
- (d) validating the transmission word by using the encoder timer, the decoder timer and their relationship with the stored timer relationship value.
26. A method according to claim 25 wherein the timer relationship value in the decoder is updated upon receipt of a valid transmission word to remove any discrepancies in the relationship between the encoder timer, decoder timer and the timer relationship value, without affecting the decoder timer.
27. A method according to claim 26 wherein the updating of the timer relationship value is only done when necessary.
28. A method according to claim 26 wherein the data word additionally includes at least one of the following: identity-information pertaining to the encoder; command information; utility information; cold boot counter information; fixed code information; encoder power supply information and user derived information.
29. A method according to claim 28 wherein the user derived information is variable via one or more inputs to the encoder and is not known to a manufacturer of the encoder.
30. A method according to claim 25 wherein the transmission word includes the encrypted data word and at least one of the following: a cold boot counter value; command information; and identity information pertaining to the encoder.
31. A method according to claim 30 wherein the cold boot counter value, when included in the transmission word, is transmitted in the clear.

32. A method according to claim 25 which includes the step of keeping the encoder and decoder in synchronism using a cold boot counter which is changed each time the encoder is powered up or comes out of reset.
33. A method according to claim 25 which includes the steps of keeping the encoder and decoder in synchronism using a cold boot counter which is changed each time the encoder is powered up or comes out of reset, and including a count value of the cold boot counter in the transmission word.
- A<sub>1</sub> 34. A method according to claim 25 which includes the step of forming a plurality of transmission words, each transmission word being different from the other transmission words and being based at least on respective encoder high speed timer information, in response to a single activation of the encoder.
35. A method according to claim 25 which includes the step of forming only a single transmission word to be transmitted at least once in response to a single activation of the encoder.
36. A method according to claim 25 which includes the steps, during a learn mode, of storing learning information at the decoder which is transferred from the encoder, and deriving a key from the stored information.
37. A method according to claim 36 wherein the learning information is stored in a first-in-first-out structure.
38. A method according to claim 25 which includes, during a learning process, the steps of determining the difference between the timer information at the encoder and the timer

information at the decoder, and storing the difference as the timer relationship value at the decoder, without affecting the decoder timer value.

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39. A method according to claim 38 wherein multiple encoders are used with a single decoder comprising a single timer and multiple timer relationship values that are determined for each encoder during its learning process.
  40. A method according to claim 25 which includes the step of ensuring that the encoder timer at its slowest variance is faster than the decoder timer at its fastest variance.
  41. A method according to claim 39 wherein, if the decoder timer lies within a predetermined window when a valid transmission word is received, the decoder timer is re-synchronized with the encoder timer by automatically adjusting the timer relationship value to remove any discrepancies in the relationship between the timers and the timer relationship value.
  42. A method according to claim 41 wherein the re-synchronization is effected by a bi-directional transfer of data between the encoder and decoder.
  43. A method according to claim 25 wherein the timer relationship value or a window is adjusted in size to compensate for drift between the encoder timer and the decoder timer, before validation occurs, such adjustment being based at least on the time period elapsed since the last adjustment of the timer relationship value.
  44. A method according to claim 25 wherein the timer relationship value or a window is adjusted in size to compensate for drift between the encoder timer and the decoder timer, such adjustment being based at least on information about the drift between the encoder timer and the decoder timer determined by analysing at least two successive valid

transmissions received with a period of time elapsed between them and said adjustment being performed before carrying out step (d) on a currently received transmission word.

45. A method according to claim 25 wherein a window size is assigned to the decoder and the encoder timer is operated to ensure that the encoder timer information does not fall outside the window for a valid transmission of a transmission word in normal operational circumstances.
- A<sub>1</sub> 46. A method according to claim 26 wherein the timer relationship value is allowed a window when validation of the transmission word occurs and the timer relationship value is adjusted based on knowledge of drift between the encoder timer, the decoder timer and the time period elapsed since a previous valid transmission of a transmission word.
47. A method according to claim 46 wherein the window size is dynamically adjusted and such adjustment is based on the time period elapsed since the previous adjustment of the timer relationship value.
48. A method according to claim 47 wherein the window size has a minimum value.
49. A method according to claim 47 wherein the window size has a maximum value.
50. A method according to claim 25 wherein the transmission data word also includes a timer value that changes fast so that each transmission word in a sequence of transmission words which are transmitted based on a single continuous activation of the encoder, differs from the other transmission words.

51. A method according to claim 25 wherein a higher security re-synchronization of the encoder and decoder timers is achieved at least by using the decoder to directly or indirectly, control the activation of the encoder.
52. Apparatus for transferring data which includes an encoder and a decoder and wherein the encoder includes a timer and an encryption unit for encrypting data which at least in part is based on timer information from the encoder timer, thereby to form a transmission word, and the decoder includes a decoder timer, a receiver unit for receiving the encrypted transmission word, a decryption unit for decrypting the received transmission word to extract, at least, the timer information from the encoder, and a comparator unit for comparing decrypted encoder timer information to timer information from the decoder timer using a timer relationship value, to determine the validity of the transmission word, the timer relationship value being established during a learning process of the encoder and decoder and being dependent at least on a difference between a value of the encoder timer and a value of the decoder timer.
53. Apparatus according to claim 52 which includes a unit for adjusting the timer relationship value when a valid transmission word is received to remove at least one of:
- (a) any drift that has occurred; and
  - (b) any other accumulating discrepancy in the relationship between the encoder timer, decoder timer and the timer relationship value.
54. Apparatus according to claim 52 wherein the timer relationship value is adjusted before checking the validity of a received transmission word, such adjustment being based at

least on a known drift between the encoder timer and the decoder timer as well as the time elapsed since a previous adjustment of the timer relationship value.

55. Apparatus according to claim 52 wherein the decoder is assigned a window size which determines acceptable drift between the encoder timer and decoder timer for a valid transmission.
56. Apparatus according to claim 55 wherein the window size is adjusted before checking the validity of a received transmission word, said adjustment being based at least on the time period elapsed since the reception of a previously received valid transmission word.
57. Apparatus according to claim 52 wherein a re-synchronization of the encoder and decoder can be achieved by the decoder providing control signals for the encoder inputs.
58. For use in the method of claim 25, a transmitter which includes an encoder timer and an encryption unit for encrypting data which at least in part is based on timer information from the encoder timer thereby to form the transmission word, and wherein the encoder timer is permitted to run only for a limited period after each activation of the transmitter.
59. For use in the method of claim 25, a transmitter which includes an encoder timer and an encryption unit for encrypting data which at least in part is based on timer information from the encoder timer thereby to form the transmission word and wherein, when the encoder timer runs beyond a predetermined limit, the transmitter will upon a single activation transmit more than one transmission value equivalent to the transmitter being activated twice.